

624-938553



April 12, 2007
Project 04516-2

Geotechnical
Environmental and
Water Resources
Engineering

Ms. Irene M. Dale
Environmental Engineer
Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

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APR 12 2007

Dear Ms. Dale:

DEP
NORTHEAST REGIONAL OFFICE

Re: Immediate Response Action Plan Modification No. 1
50 Tufts Street
Somerville, MA
RTN 3-26114

On behalf of UniFirst Corporation of Wilmington, Massachusetts, we prepared this Immediate Response Action (IRA) Plan Modification No. 1 for a release of chlorinated volatile organic compounds (VOCs) associated with 50 Tufts Street in Somerville, Massachusetts (the Site). The IRA Plan was originally submitted to Massachusetts Department of Environmental Protection (DEP) on April 9, 2007. The Site location is shown in Figure 1 and a Site Plan in Figure 2.

The DEP assigned Release Tracking Numbers (RTNs) 3-23246, 3-24358, 3-24376, and 3-26114 to reported releases associated with the Site. The Site is currently classified Tier IC. Three of the RTNs for the Site (3-23246, 3-24358, and 3-24376) were consolidated under RTN 3-23246 at the time the Tier IC permit application was submitted to DEP on June 16, 2006. An additional Release Tracking Number RTN 3-26114 was assigned to the Site in August 2006, in connection with detections of tetrachloroethylene (PCE) reported in two homes.

IRA Modification No. 1 is for activities conducted and to be conducted in residences near the Site along Dell, Knowlton, Morton, Glen, Franklin, Tufts, and Alston Streets. IRA activities were initiated on January 22, 2007 and are on-going. These activities were verbally approved by Ms. Irene Dale of the DEP during the frequent phone conversations throughout January and February 2007 between Ms. Dale and Ms. Ileen Gladstone, P.E., LSP of GEI Consultants, Inc. The activities described in this IRA Modification also were described and discussed at a public meeting held in Somerville on February 26, 2007.

The IRA Transmittal Form (BWSC105) for IRA Modification No. 1 was submitted by eDEP on April 11, 2007 a copy is in Attachment A.

The detection of vapor-phase emissions of measurable concentrations in the residences represents a Critical Exposure Pathway (CEP). UniFirst initiated the measures described in this IRA Plan Modification to mitigate the CEP, rather than running calculations and potentially addressing the concentrations detected as an "imminent hazard." For the same reason, Item H3. on Form BWSC105 was not checked. GEI has communicated with the City, however, throughout the IRA process.

REF
354.353
GEI

w.geiconsultants.com

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000 fax: 781.721.4073

1. CONTACT INFORMATION

Entity Undertaking the IRA
Brian Keegan
Senior Engineering Manager
UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887
978.658.8888 ext 645

Licensed Site Professional
Ileen S. Gladstone, P.E., LSP
Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4012
LSP License: 9719

2. BACKGROUND

Chlorinated VOCs, particularly PCE, have been measured in soil, groundwater, and indoor air at the Site. The source of the chlorinated VOCs is likely associated with the historic handling, storage, and distribution of laundry and dry cleaning chemicals at the 50 Tufts Street property (Property). Chlorinated VOCs were measured in an indoor air sample collected in the Property building. Chlorinated VOCs have also been detected in groundwater samples collected from monitoring wells located in the neighborhood east of the Property and in the indoor air in several buildings and at the Michael E. Capuano Early Childhood Center at 150 Glen Street.

3. IRA OBJECTIVES, PLAN, AND SCHEDULE (310 CMR 40.0424[1][E])

3.1. IRA Objectives

The purpose of this IRA Modification is to further evaluate and address vapor intrusion as a potential exposure pathway in buildings located in the vicinity of the Property.

The objectives of this IRA Modification are to:

- Collect indoor air samples from selected buildings along Dell, Knowlton, Tufts, Franklin, and Alston Streets.
- Collect soil gas samples from beneath buildings in the vicinity of the Property to evaluate the potential for chlorinated VOCs to be present in indoor air.
- Based on the results of sub-slab soil gas and/or indoor air testing, to implement such temporary (including sealing foundations and installing air purifiers) and permanent mitigation measures (sub-slab depressurization system (SSDS)) as appropriate; and
- Monitor the effectiveness of the mitigation measures undertaken.

3.2. Completed IRA Activities

3.2.1. Indoor Air Testing

GEI attended several Board of Alderman meetings and community meetings regarding the 50 Tufts Street project. At several of these meetings individual property owners requested indoor air testing for chlorinated VOCs. Based on these requests GEI personnel collected indoor air samples:

- On January 22 and 23, 2007, at 6, 9, 10, 14, 16, and 22 Dell Street; 33 and 37 Knowlton Street; and 60 Tufts Street.
- On February 14, 2007, at 91/93 Franklin Street, and 32 and 40 Alston Street.

The indoor air samples were collected into six-liter summa canisters over a 4-hour period. GEI submitted the indoor air samples for laboratory testing of selected chlorinated VOCs by U.S. Environmental Protection Agency (EPA) Method TO-15.

3.3. Planned IRA Activities

3.3.1. Evaluation of Additional Homes

Based on previous and recent groundwater, soil gas and indoor air testing results, GEI identified a several block area near the 50 Tufts Street property in which to evaluate vapor intrusion as a potential exposure pathway. The properties to be evaluated are listed on Table 1 and shown on Figure 2.

The evaluation process includes:

- Contacting individual property owners by mail to inform them of the potential for the indoor air of their property to be affected by the subsurface chlorinated VOCs contamination. A copy of the contact letter is Attachment B.
- Contacting the individual property owners to meet to discuss the planned remedial measures and/or to schedule a building inspection and soil gas sampling.
- Inspecting each building to collect information about the basement, including the type and condition of the foundation. We also will collect information on the building's heating and cooling system.
- During the inspection, installing one or two sub-slab monitoring points in the basement. These will be installed by drilling a small hole (~3/4 inch diameter) through the basement slab and inserting tubing. We will measure the pressure beneath the slab and collect a sample of the soil gas from beneath the slab for laboratory testing. A picture of what this sampling looks like is shown on the attached Figure 3.

3.3.2. Criteria for Mitigative Measures in Residences

Based on the concentrations of chlorinated VOCs detected in the sub-slab soil gas, we will offer property owners one of the following response actions: (1) installation of a temporary air purifier, pending sealing of significant floor penetrations and installation of an SSDS in a building; (2) indoor air testing to confirm whether an SSDS is warranted (sealing of significant floor penetrations may be conducted prior to testing); or (3) no additional action. The criteria for the recommendation will be:

- Installation of Purifier/SSDS: Total chlorinated VOCs greater than 561 $\mu\text{g}/\text{m}^3$.
- Indoor air testing: Total chlorinated VOCs between 10 and 561 $\mu\text{g}/\text{m}^3$.
- No additional action: Total chlorinated VOCs less than 10 $\mu\text{g}/\text{m}^3$.

AMEC Earth and Environmental derived the sub-slab soil gas concentration action level to install an SSDS (561 $\mu\text{g}/\text{m}^3$) based on the methodology embedded in the Johnson-Ettinger model to derive an acceptable indoor air concentration of PCE to achieve a level of no significant risk. The sub-slab soil gas action level requiring no additional action (10 $\mu\text{g}/\text{m}^3$) was provided by DEP. This is a very conservative screening value that will be used solely for purposes of this evaluation.

In developing their GW-2 groundwater standards, DEP derived a groundwater to indoor air attenuation factor of 7.28×10^{-4} (1,379x) using EPA's version of the Johnson & Ettinger vapor

intrusion (J&E VI) model. The DEP calculations do not specifically derive a soil gas to indoor air attenuation factor. However, one can parameterize the J&E VI model in the manner that DEP parameterized the groundwater-based model, and then run the soil gas to indoor air version of the J&E VI model to determine the “equivalent” soil gas to indoor air attenuation factor (alpha).

AMEC performed this J&E VI model run, confirmed a groundwater to indoor air alpha of 7.28×10^{-4} for PCE, and calculated a soil gas to indoor air alpha of 1.07×10^{-3} (935x).

DEP evaluated actual sub-slab soil gas data and co-located indoor air data and calculated actual field sub-slab soil gas to indoor air attenuation factors for PCE and other constituents. In “*An Evaluation of Vapor Intrusion into Buildings through a Study of Field Data*” (Fitzpatrick, N.A. and John J. Fitzgerald, 1996), the field sub-slab soil gas to indoor air attenuation factors for PCE were summarized. They ranged from 1.3×10^{-4} to 1.0×10^{-1} with a mean of 2.8×10^{-2} .

The current GW-2 standards are based on the J&E VI model parameterized in such a way that the equivalent soil gas to indoor air alpha would be 1.07×10^{-3} (935x). The mean of measured soil gas to indoor air alpha values at residences in eastern Massachusetts was 2.8×10^{-2} (36x). The worst case measured soil gas to indoor air alpha value at residences in eastern Massachusetts was 1.0×10^{-1} (10x). Thus, sub-slab soil gas screening values for PCE can be derived for the 50 Tufts Street site in Somerville, MA using indoor air attenuation factors ranging from 1.07×10^{-3} to 1.0×10^{-1} (935x to 10x).

If one uses the DEP Unit Risk Factor for PCE (which AMEC believes to be out of date and inconsistent with current scientific principles and the factors calculated more recently by other environmental and health authorities), the acceptable indoor air concentration to achieve a level of No Significant Risk would be $0.6 \mu\text{g}/\text{m}^3$. Using an indoor air attenuation factor of 1.07×10^{-3} , the risk-based screening level concentration of PCE in sub-slab soil gas is $561 \mu\text{g}/\text{m}^3$ (935 X $0.6 \mu\text{g}/\text{m}^3$).

In summary, the action level to install a SSDS ($561 \mu\text{g}/\text{m}^3$) assumes:

- The DEP Unit Risk Factor (URF).
- Residences are occupied 24 hours a day, 7 days a week for 30 years.
- The sub-slab soil gas to indoor air attenuation factor that is equivalent to the current GW-2 standard, because it results from the Johnson-Ettinger Model parameterized as DEP parameterizes it in deriving the current GW-2 standards.
- All basements are living spaces with daily lifetime exposure to basement PCE concentrations, which clearly overestimates exposure in most, if not all, cases.
- A sub-slab soil gas to indoor air attenuation factor of 1.07×10^{-3} that is within the range of actual sub-slab soil gas to indoor air attenuation factors measured in eastern Massachusetts.
- A factor of 3 of the World Health Organization Air Guideline for daily lifetime exposure and the ATSDR Chronic Minimum Risk Level for PCE.
- An Excess Lifetime Cancer Risk of 1×10^{-5} is allocated to PCE.

All of the foregoing assumptions, including DEP’s attenuation and Unit Risk Factors, are very conservative, and they will be used solely for purposes of the present evaluation. In undertaking its Method 3 risk assessment for the Site, for example, AMEC will conduct an independent evaluation of these and all other pertinent assumptions.

3.3.3. Indoor Air Testing in Residences

Indoor air testing will be conducted in a residence where the concentration of PCE in the sub-slab soil gas is greater than $10 \mu\text{g}/\text{m}^3$ and less than $561 \mu\text{g}/\text{m}^3$. An SSDS will be recommended if the concentration of PCE in indoor air at a residence is greater than $5.8 \mu\text{g}/\text{m}^3$. Up to four rounds of indoor air testing will be performed to confirm that the concentration in indoor air is less than the recommended action level ($5.8 \mu\text{g}/\text{m}^3$). This indoor air action level is based on achieving a level of No Significant Risk for the long-term, assuming solely for purposes of this evaluation:

- All basements are living spaces with daily lifetime exposure to basement PCE concentrations, which clearly overestimates exposure in most, if not all, cases.
- Residences are occupied 24 hours a day, 7 days a week for 30 years.
- The EPA URF for PCE which is consistent with current science.
- An Excess Lifetime Cancer Risk of 1×10^{-5} is allocated to PCE.

3.3.4. Criteria for Mitigative Measures in Commercial Buildings

Based on the concentrations of chlorinated VOCs detected in the sub-slab soil gas, we will offer commercial property owners one of the following response actions: (1) installation of an SSDS in a building; (2) indoor air testing to confirm whether an SSDS is warranted (sealing of significant floor penetrations may be conducted prior to testing); or (3) no additional action. The criteria for the recommendation will be:

- Installation SSDS: Total chlorinated VOCs greater than $2,992 \mu\text{g}/\text{m}^3$.
- Indoor air testing: Total chlorinated VOCs between 32 and $2,992 \mu\text{g}/\text{m}^3$.
- No additional action: Total chlorinated VOCs less than $32 \mu\text{g}/\text{m}^3$.

AMEC derived the commercial sub-slab soil gas concentration action level to install an SSDS ($2,992 \mu\text{g}/\text{m}^3$) based on the methodology embedded in the Johnson-Ettinger model to derive an acceptable indoor air concentration of PCE to achieve a level of No Significant Risk. The commercial sub-slab soil gas action level requiring no additional action ($32 \mu\text{g}/\text{m}^3$) was calculated based on a No Significant Risk level and a very conservative indoor air attenuation factor reported by DEP.

As noted above in Section 3.3.2, AMEC performed a J&E VI model run, confirmed a groundwater to indoor air alpha of 7.28×10^{-4} for PCE, and calculated a soil gas to indoor air alpha of 1.07×10^{-3} (935x). This alpha value is used to derive the commercial sub-slab soil gas concentration action level to install an SSDS. In addition, DEP evaluated actual sub-slab soil gas data and co-located indoor air data and calculated actual field sub-slab soil gas to indoor air attenuation factors for PCE and other constituents. In "*An Evaluation of Vapor Intrusion into Buildings through a Study of Field Data*" (Fitzpatrick, N.A. and John J. Fitzgerald, 1996), the field sub-slab soil gas to indoor air attenuation factors for PCE were summarized. They ranged from 1.3×10^{-4} to 1.0×10^{-1} with a mean of 2.8×10^{-2} . The most conservative alpha value of 1.0×10^{-1} (10X) was used to derive the commercial sub-slab soil gas action level requiring no additional action.

If one uses the DEP Unit Risk Factor for PCE (which AMEC believes to be out of date and inconsistent with current scientific principles and the factors calculated more recently by other environmental and health authorities), the acceptable indoor air concentration to achieve a level of No Significant Risk in a commercial building would be $3.2 \mu\text{g}/\text{m}^3$. Using an indoor air

attenuation factor of 1.07×10^{-3} from the DEP's GW-2 standards, the risk-based screening level concentration of PCE in sub-slab soil gas at commercial buildings is $2,992 \mu\text{g}/\text{m}^3$ ($935 \times 3.2 \mu\text{g}/\text{m}^3$).

In summary, the action level to install a SSDS in a commercial building ($2,992 \mu\text{g}/\text{m}^3$) assumes:

- The DEP Unit Risk Factor (URF).
- Commercial buildings are occupied 8 hours a day, 5 days a week for 25 years.
- The sub-slab soil gas to indoor air attenuation factor that is equivalent to the current GW-2 standard, because it results from the Johnson-Ettinger Model parameterized as DEP parameterizes it in deriving the current GW-2 standards.
- A sub-slab soil gas to indoor air attenuation factor of 1.07×10^{-3} that is within the range of actual sub-slab soil gas to indoor air attenuation factors measured in eastern Massachusetts.
- An Excess Lifetime Cancer Risk of 1×10^{-5} is allocated to PCE.

Using an indoor air attenuation factor of 1.0×10^{-1} , the risk-based screening level concentration of PCE in sub-slab soil gas at commercial buildings that would require no additional action is $32 \mu\text{g}/\text{m}^3$ ($10 \times 3.2 \mu\text{g}/\text{m}^3$).

All of the foregoing assumptions, including DEP's attenuation and Unit Risk Factors, are very conservative, and they will be used solely for purposes of the present evaluation. In undertaking its Method 3 risk assessment for the Site, for example, AMEC will conduct an independent evaluation of these and all other pertinent assumptions.

3.3.5. Indoor Air Testing in Commercial Buildings

Indoor air testing will be conducted in a commercial building where the concentration of PCE in the sub-slab soil gas is greater than $32 \mu\text{g}/\text{m}^3$ and less than $2,992 \mu\text{g}/\text{m}^3$. An SSDS will be recommended if the concentration of PCE in indoor air at a commercial building is greater than $29 \mu\text{g}/\text{m}^3$. Up to four rounds of indoor air testing will be performed to confirm that the concentration in indoor air is less than the recommended action level ($29 \mu\text{g}/\text{m}^3$). This indoor air action level is based on achieving a level of No Significant Risk for the long-term, assuming solely for purposes of this evaluation:

- Commercial buildings are occupied 8 hours a day, 5 days a week for 25 years.
- The EPA URF for PCE which is consistent with current science.
- An Excess Lifetime Cancer Risk of 1×10^{-5} is allocated to PCE.

3.3.6. Air Purifiers

If we recommend installing an SSDS, based on the comparison of the concentration measured in sub-slab soil gas or indoor air to the above screening values for a residence, we also will offer to install a temporary portable air purifier in the basement of that residence. Air purifiers will be the 5000 VOCARB model manufactured by Allerair of Montreal, Quebec. The 5000 VOCARB is the same model previously installed and currently operating at residences on Tufts Street. GEI will reimburse residents for the cost of electricity required to run the air purifier. Literature describing the air purifier is in Attachment C. GEI will recommend that the air purifiers operate on the "high" setting. GEI will inspect and clean the air purifiers quarterly. If an SSDS is installed, the air purifiers will be removed.

3.3.7. Sub-Slab Depressurization System

For those residences and buildings where an SSDS is recommended based on the results of the sub-slab soil gas testing and/or indoor air testing (if performed), GEI will:

- As warranted, arrange for a contractor to seal significant, cracks, seams, and utility penetrations. The purpose of the sealing is to close potential pathways from the ground through the slab into the home.
- Install an SSDS similar to that depicted in the attached Figure 4. The system will be similar to those commonly used to address radon in homes, and will be installed by a licensed radon contractor. A typical design would include coring one or two holes (of approximately 4-inch diameter) through the basement slab and attaching PVC piping to each. The pipes will then be run overhead or along the wall, and joined to one common pipe before exiting through the wall to the exterior of the house. An inline fan will be installed in the exterior pipe and the pipe will extend up the outside wall to above the eaves of the house. Figure 5 shows an example of the exterior exhaust piping associated with a SSDS.

Finally, it is important to note that the results of the evaluations outlined above for individual buildings will be considered collectively with the results of all soil gas, indoor air, and groundwater sampling results. GEI anticipates that adjustments may be made in individual cases to initiate additional sampling or mitigation activities if warranted by the conceptual model.

4. REMEDIATION WASTE MANAGEMENT

Small amounts of soil may be generated from coring through the basement slab during sub-slab sampling and SSDS installation. The soil will be screened for VOCs by jar head space techniques. We anticipate that the excavated soil will be from above the water table, not have elevated jar headspace readings, and will not be considered remediation waste. Cuttings from the coring will be drummed and transported off-site as surplus material. If an elevated jar headspace reading (greater than 1 ppm) is measured, the soil will be segregated and managed as remediation waste.

We do not anticipate performing dewatering during the installation of the SSDS.

5. ENVIRONMENTAL MONITORING PLAN AND PERMITS

5.1. Environmental Monitoring Plan

5.1.1. Prior to SSDS Start-up

For residences and buildings where an SSDS is installed, prior to the start-up of the SSDS, GEI will measure:

- Sub-slab VOC concentrations at each sub-slab penetration point of the SSDS using a photoionization detector capable of measuring parts per billion (ppbPID), and pressure at each extraction point using a manometer calibrated to 0.001-inch water.

5.1.2. After SSDS Start-Up

Approximately one week after the start-up of the SSDS, GEI will measure

- Sub-slab VOC concentrations at each sub-slab penetration point using a ppbPID.

- Sub-slab pressure using a manometer with a detection limit of 0.001-inch water.
- VOC concentrations in the basement and living space of the residence and in the basement and/or working space in the first floor of a commercial building.

After six months of operation of the SSDS, GEI will measure:

- Sub-slab VOC concentrations at each sub-slab penetration point using a ppbRAE.
- Sub-slab pressure using a manometer with a detection limit of 0.001-inch water.
- VOC concentrations in the basement and living space of the residence and in the basement and/or working space in the first floor of a commercial building.

After six months, additional monitoring, if required, will be evaluated and submitted to DEP for review and comment.

5.2. Permits

GEI's subcontractor for SSDS installation will obtain necessary permits, such as electrical permits, from the city of Somerville prior to the start of work.

6. SCHEDULE

IRA activities are ongoing. The schedule for completing these activities depends on our ability to obtain contact information for property owners, to reach them by phone or in person, and to enlist their cooperation so that we can enter their buildings. The proposed schedule is:

Activity	Timeframe
Collect indoor air samples in residences along Dell, Knowlton and Tufts Street	January 22 & 23, 2007
Collect indoor air samples in residence and commercial building on Franklin and Alston Street.	February 14, 2007
Mail letter to property owners informing them of the proposed evaluation process.	Ongoing, initiated March 2, 2007
Conduct building inspections and collect sub-soil gas sample.	Ongoing, initiated February 15, 2007 to continue over several months depending on access.
Install SSDS	Initiate April 2007, to continue over several months depending on access.
Indoor air monitoring	To confirm SSDS is not required or following installation of SSDS.

Please contact me at 781.721.4012 or igladstone@geiconsultants.com if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read 'Ileen S. Gladstone', with a large, stylized loop at the beginning and a horizontal stroke extending to the right.

Ileen S. Gladstone, P.E., LSP
Vice President

MCE/ISG:jah
Enclosures

c: Brian Keegan, UniFirst Corporation
Peter Mills, City of Somerville

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Environmental and
Water Resources
Engineering



Table 1

Properties to Be Evaluated For Vapor Intrusion as a Potential Exposure Pathway

50 Tufts Street

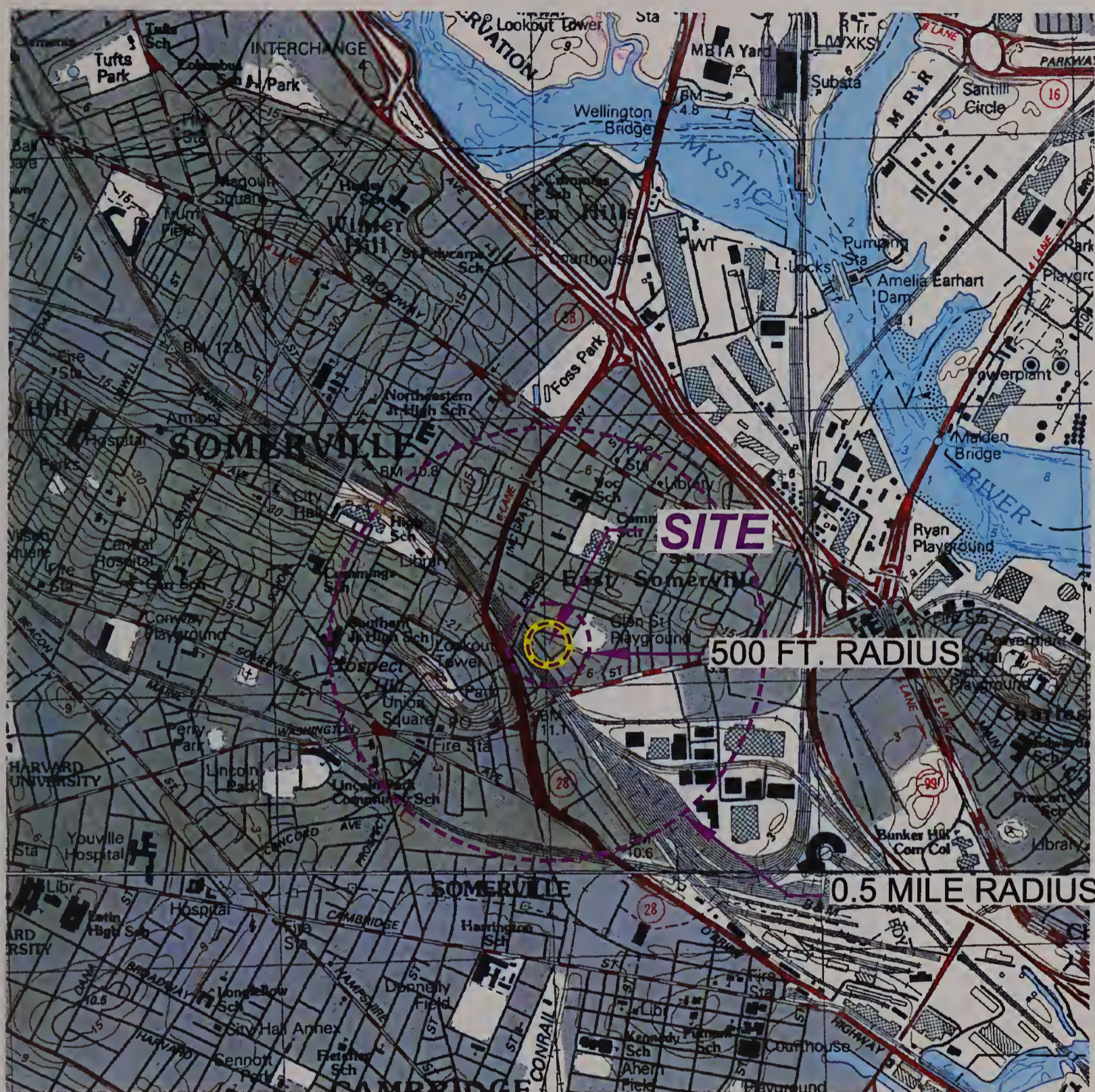
Somerville, MA

2 Alston Street	168 Glen Street	19-19A Morton Street
6 Alston Street	2 Hadley Court	21 Morton Street
10 Alston Street	9 Knowlton Street	9 Tufts Street
12 Alston Street	12-14 Knowlton Street	11-13 Tufts Street
20 Alston Street	13 Knowlton Street	17 Tufts Street
30-40 Alston Street	17 Knowlton Street	19 Tufts Street
142 Cross Street	19 Knowlton Street	23 Tufts Street
74 Franklin Street	23 Knowlton Street	25 Tufts Street
76 Franklin Street	27 Knowlton Street	27 Tufts Street
80 Franklin Street	29 Knowlton Street	45-47 Tufts Street
82 Franklin Street	32 Knowlton Street	49 Tufts Street
86 Franklin Street	31-33 Knowlton Street	51a Tufts Street
91-93 Franklin Street	34 Knowlton Street	53 Tufts Street
95 Franklin Street	35-37 Knowlton Street	60 Tufts Street
95r Franklin Street	4 Morton Street	85 Washington Street
97 Franklin Street	7 Morton Street	91 Washington Street
97r Franklin Street	8 Morton Street	97 Washington Street
99 Franklin Street	10 Morton Street	103 Washington Street
152-154 Glen Street	11 Morton Street	105-107 Washington Street
153-155 Glen Street	12 Morton Street	111 Washington Street
159 Glen Street	13 Morton Street	113 Washington Street
163 Glen Street	15 Morton Street	117 Washington Street
162-164 Glen Street	18 Morton Street	121 Washington Street



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Water Resources
Engineering





0 1000 2000 4000 6000
SCALE, FEET

This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD).
Contour Interval is 3 Meters.



Immediate Response Action Modification No. 1
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts

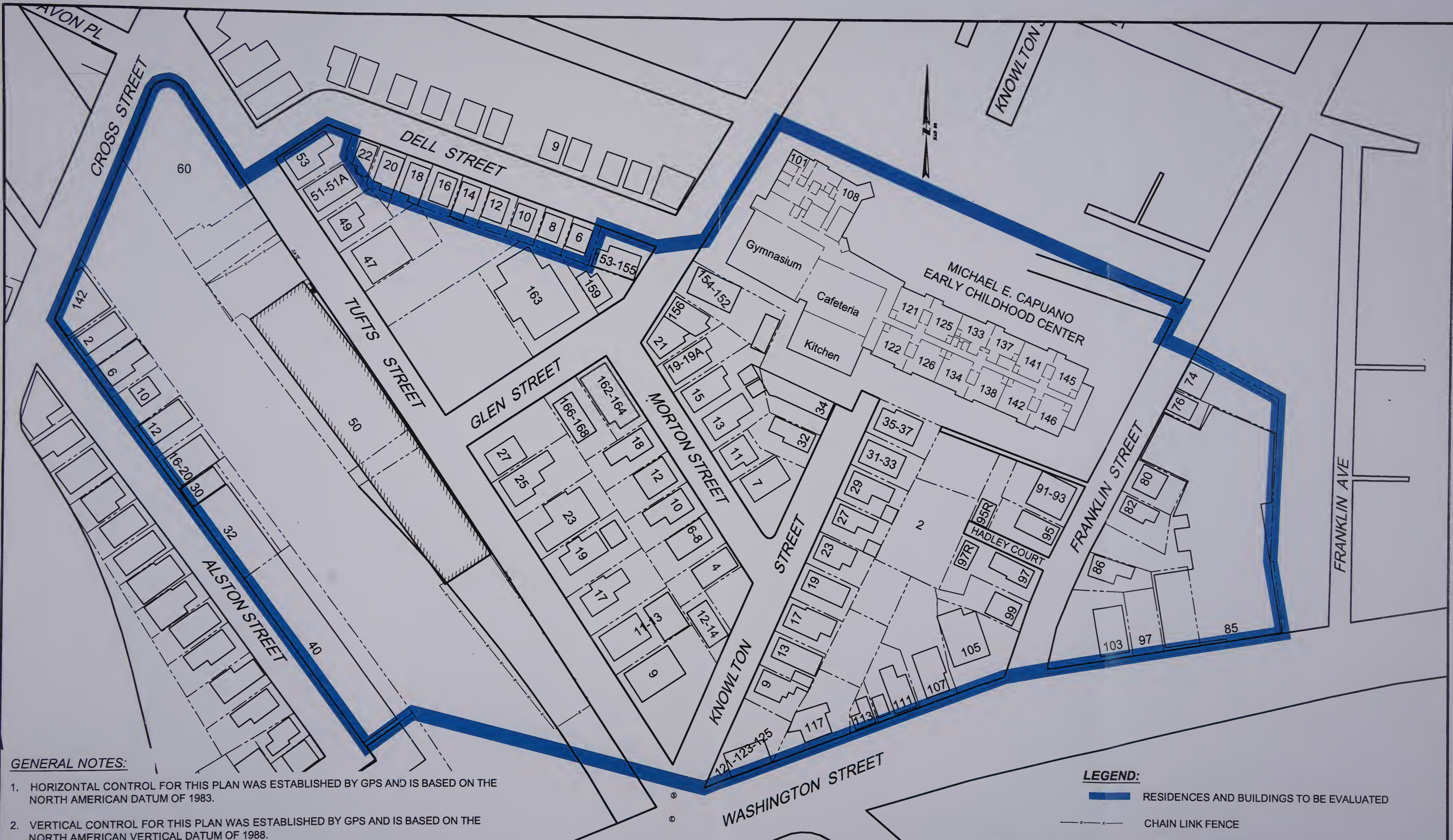
GEI Consultants

SITE LOCATION MAP

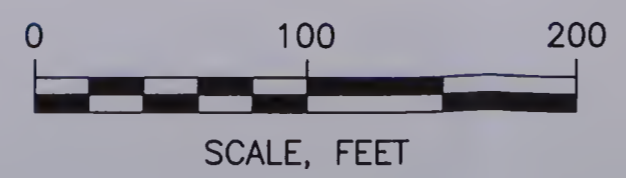
Project 04516-2

April 2007

Fig. 1



- GENERAL NOTES:**
1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
 2. VERTICAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
 3. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
 4. EXISTING MONITORING WELL LOCATIONS AND ELEVATIONS WERE ESTABLISHED BY AN ON THE GROUND SURVEY BY BSC GROUP, INC. ON MAY 31, 2006. PVC AND GROUND ELEVATIONS WERE ESTABLISHED BY TRIGONOMETRIC METHODS USING A TOTAL STATION.




- LEGEND:**
- RESIDENCES AND BUILDINGS TO BE EVALUATED
 - CHAIN LINK FENCE

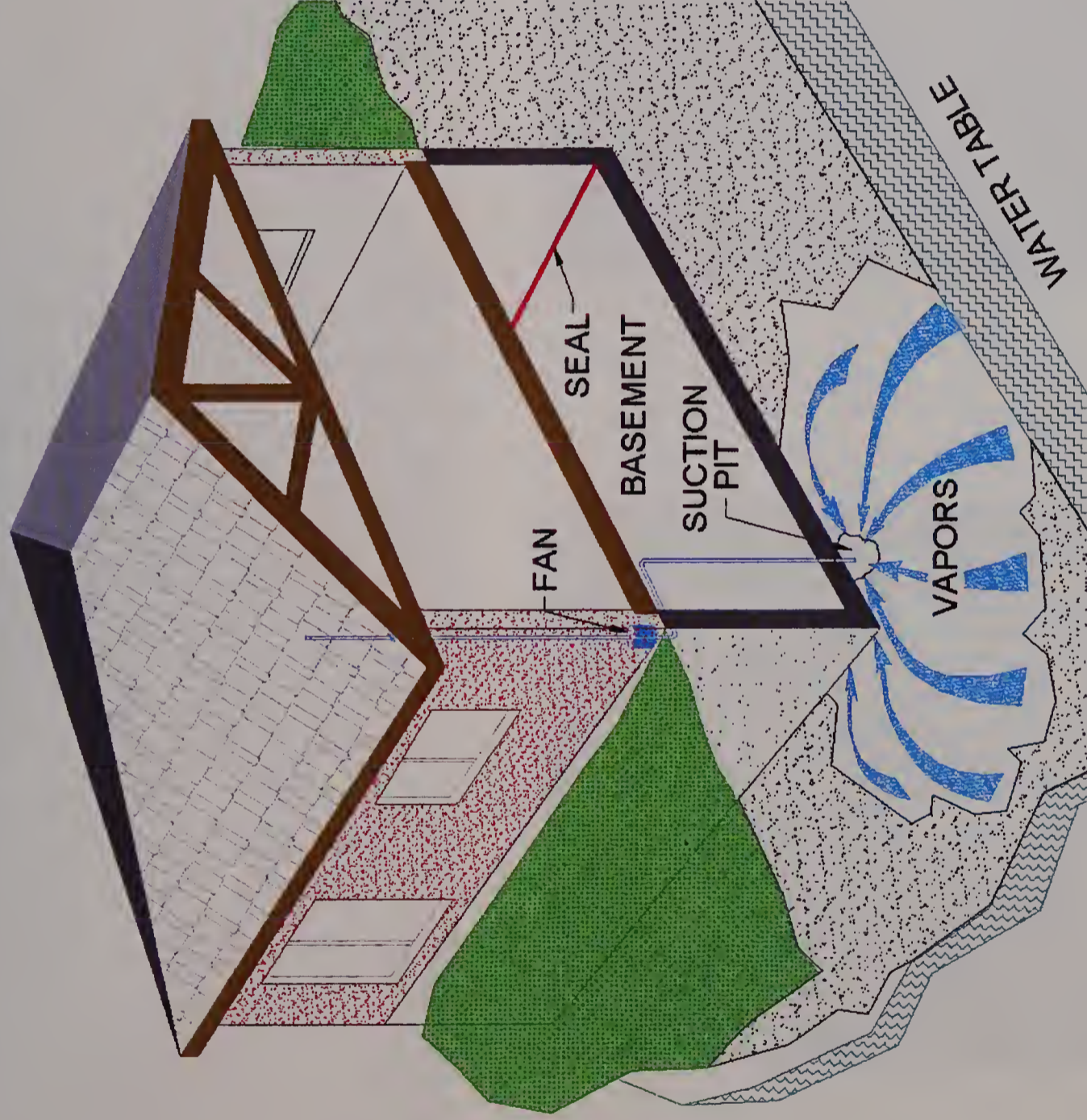
Immediate Response Action Modification No. 1 50 Tufts Street Somerville, Massachusetts		 GEI Consultants	SITE PLAN	
UniFirst Corporation Wilmington, Massachusetts			Project 04516-2	April 2007

Fig. 2



Immediate Resonse Action Modification No. 1 50 Tufts Street Somerville, Massachusetts UniFirst Corporation Wilmington, Massachusetts	 GEI Consultants	TEMPORARY SUB-SLAB MONITORING POINT	
		Project 04516-2	April 2007

Sub-Slab Depressurization



Immediate Response Action Modification No. 1
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts



SUB-SLAB
DEPRESSURIZATION SYSTEM

Project 04516-2

April 2007

Fig. 4



Immediate Response Action Modification No. 1
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

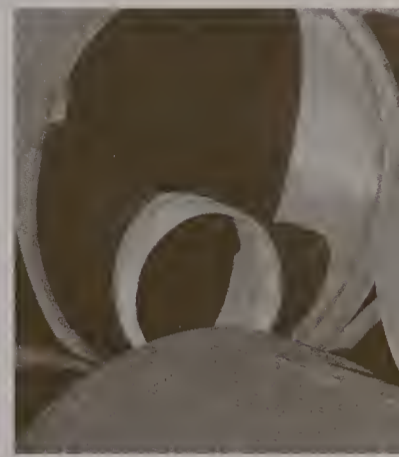
EXTERIOR EXHAUST PIPING
FOR SUB-SLAB
DEPRESSURIZATION SYSTEM

April 2007

Fig. 5



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ATTACHMENT A

Immediate Response Action (IRA) Transmittal Form
(BWSC105)



Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username: **JHAWKER**

Transaction ID: **121158**

Document: **BWSC 105 IRA**

Size of File: **140.419 K**

Status of Transaction: **SUBMITTED**

Date and Time Created: **4/11/2007::2:12:17 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

**IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM** Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

3

-

26114

A. RELEASE OR THREAT OF RELEASE LOCATION:

1. Release Name/Location Aid:

NO LOCATION AID

2. Street Address:

50 TUFTS ST

3. City/Town:

SOMERVILLE

4. ZIP Code:

5. UTM Coordinates:

a. UTM N:

4694310

b. UTM E:

328046

☐ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.

☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

☐ 7. Check here if this location is Adequately Regulated, pursuant to 310 CMR 40.0110-0114. Specify Program (check one):

☐ a. CERCLA ☐ b. HSWA Corrective Action ☐ c. Solid Waste Management

☐ d. RCRA State Program (21C Facilities)

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial IRA Written Plan (if previously submitted):

4/9/2007

(mm/dd/yyyy)

☐ 2. Submit an **Initial IRA Plan**.

☒ 3. Submit a **Modified IRA Plan** of a previously submitted written IRA Plan.

☐ 4. Submit an **Imminent Hazard Evaluation**. (check one)

☐ a. An Imminent Hazard exists in connection with this Release or Threat of Release.

☐ b. An Imminent Hazard does not exist in connection with this Release or Threat of Release.

☐ c. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release, and further assessment activities will be undertaken.

☐ d. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release. However, response actions will address those conditions that could pose an Imminent Hazard.

☐ 5. Submit a request to **Terminate an Active Remedial System or Response Action(s) Taken to Address an Imminent Hazard**.

☐ 6. Submit an **IRA Status Report**.

☐ 7. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Frequency of Submittal: (check all that apply)

☐ i. A Remedial Monitoring Report(s) submitted monthly to address an Imminent Hazard.

☐ ii. A Remedial Monitoring Report(s) submitted monthly to address a Condition of Substantial Release Migration.

☐ iii. A Remedial Monitoring Report(s) submitted concurrent with a IRA Status Report.

c. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC105A, IRA Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.



IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number
3 - 26114

B. THIS FORM IS BEING USED TO (cont.): (check all that apply)

- ☐ 8. Submit an IRA Completion Statement.
- a. Check here if future response actions addressing this Release or Threat of Release notification condition will be conducted as part of the Response Actions planned or ongoing at a Site that has already been Tier Classified under a different Release Tracking Number (RTN) . When linking RTNs, rescoring via the NRS is required if there is a reasonable likelihood that the addition of the new RTN(s) would change the classification of the site.
- ☐ b. Provide Release Tracking Number of Tier Classified Site (Primary RTN): -

These additional response actions must occur according to the deadlines applicable to the Primary RTN. Use the Primary RTN when making all future submittals for the site unless specifically relating to this Immediate Response Action.

- ☐ 9. Submit a Revised IRA Completion Statement.

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT IRA:

1. Identify Media Impacted and Receptors Affected: (check all that apply)

- ☒ a. Air ☒ b. Basement ☒ c. Critical Exposure Pathway ☒ d. Groundwater ☒ e. Residence
- ☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☐ i. School ☐ j. Sediments
- ☐ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2
- ☐ q. Others Specify: _____

2. Identify Oils and Hazardous Materials Released: (check all that apply)

- ☐ a. Oils ☒ b. Chlorinated Solvents ☐ c. Heavy Metals
- ☐ d. Others Specify: _____

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

- | | |
|--|---|
| <input type="checkbox"/> 1. Assessment and/or Monitoring Only | <input type="checkbox"/> 2. Temporary Covers or Caps |
| <input type="checkbox"/> 3. Deployment of Absorbent or Containment Materials | <input type="checkbox"/> 4. Temporary Water Supplies |
| <input checked="" type="checkbox"/> 5. Structure Venting System | <input type="checkbox"/> 6. Temporary Evacuation or Relocation of Residents |
| <input type="checkbox"/> 7. Product or NAPL Recovery | <input type="checkbox"/> 8. Fencing and Sign Posting |
| <input type="checkbox"/> 9. Groundwater Treatment Systems | <input type="checkbox"/> 10. Soil Vapor Extraction |
| <input type="checkbox"/> 11. Bioremediation | <input type="checkbox"/> 12. Air Sparging |



**IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM** Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

3 - **26114**

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☐ 13. Excavation of Contaminated Soils

☐ a. Re-use, Recycling or Treatment

☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

ii.a. Receiving Facility: _____ Town: _____ State: _____

ii.b. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

☐ b. Store

☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

ii.a. Receiving Facility: _____ Town: _____ State: _____

ii.b. Receiving Facility: _____ Town: _____ State: _____

☐ c. Landfill

☐ i. Cover Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

☐ ii. Disposal Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

☐ 14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☐ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

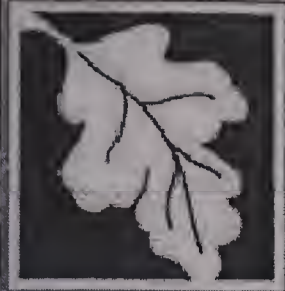
☒ 16. Other Response Actions:

Describe: _____

TEMPORARY INSTALLATION OF AIR PURIFIERS

☐ 17. Use of Innovative Technologies:

Describe: _____



**IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM** Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

3

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26114

E. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that an **Immediate Response Action Plan** is being submitted, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that an **Imminent Hazard Evaluation** is being submitted, this Imminent Hazard Evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and the assessment activity(ies) undertaken to support this Imminent Hazard Evaluation comply(ies) with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000;

> if Section B of this form indicates that an **Immediate Response Action Status Report** and/or a **Remedial Monitoring Report** is(are) being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that an **Immediate Response Action Completion Statement** or a request to **Terminate an Active Remedial System or Response Action(s) Taken to Address an Imminent Hazard** is being submitted, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 9719

2. First Name: ILEEN S

3. Last Name: GLADSTONE

4. Telephone: 7817214012

5. Ext.:

6. FAX:

7. Signature: ILEEN S GLADSTONE

8. Date: 04/11/2007

(mm/dd/yyyy)

9. LSP Stamp:





**IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM** Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number

3

-

26114

F. PERSON UNDERTAKING IRA:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions
2. Name of Organization: **UNIFIRST CORP**
3. Contact First Name: **BRIAN** 4. Last Name: **KEEGAN**
5. Street: **68 JONSPIN RD** 6. Title: **ENV ENG MANAGER**
7. City/Town: **WILMINGTON** 8. State: **MA** 9. ZIP Code: **01887-0000**
10. Telephone: **8003477888** 11. Ext.: 12. FAX:

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING IRA:

- ☒ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter
- ☒ e. Other RP or PRP Specify: **PRP GENERIC OR NON-SPECIFIED**
- ☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
- ☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))
- ☐ 4. Any Other Person Undertaking IRA Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

- ☐ 1. Check here if any Remediation Waste, generated as a result of this IRA, will be stored, treated, managed, recycled or reused at the site following submission of the IRA Completion Statement. If this box is checked, you must submit one of the following plans, along with the appropriate transmittal form.
- ☐ a. A Release Abatement Measure (RAM) Plan (BWSC106) ☐ b. Phase IV Remedy Implementation Plan (BWSC108)
- ☐ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.
- ☐ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the implementation of an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.
- ☐ 4. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the submittal of a Completion Statement for an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.
- ☐ 5. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to the DEP Regional Office.
- ☒ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.



IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL
FORM Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number
3 - 26114

I. CERTIFICATION OF PERSON UNDERTAKING IRA:

1. I, **BRIAN E KEEGAN**, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: **BRIAN E KEEGAN** Signature 3. Title: **ENV ENG MANAGER**

4. For: **UNIFIRST CORP** 5. Date: **04/11/2007**
(Name of person or entity recorded in Section F) (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____
8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____
11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

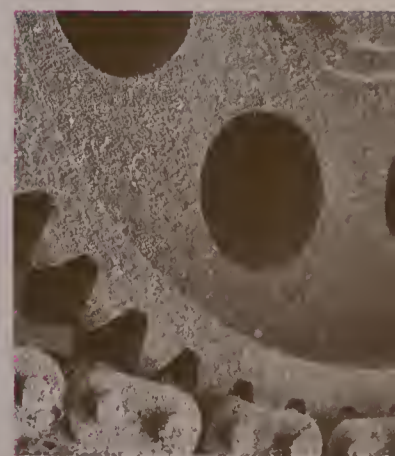
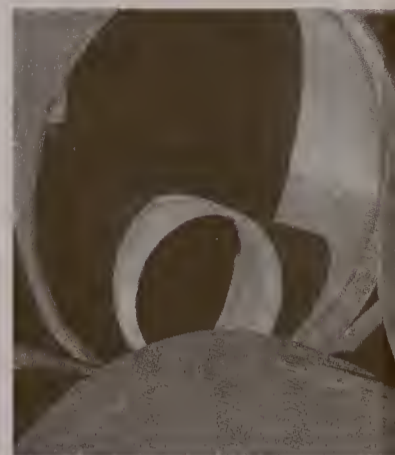
YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO \$10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

4/11/2007 2:03:35 PM



Geotechnical
Environmental and
Water Resources
Engineering



ATTACHMENT B

Property Owner Letters

March 5, 2007
Project 04516-2



«Owner»
«Address_1»
«Address_2»
«City_State»

Dear «Salutation»:

Re: Property Evaluation
«Property»
Somerville, Massachusetts

GEI Consultants, Inc. (GEI) is working cooperatively with the Massachusetts Department of Environmental Protection and the City of Somerville to conduct an environmental investigation in the vicinity of 50 Tufts Street in Somerville, Massachusetts. For purposes of our investigation, we would like to visit and conduct an evaluation of your property. The purpose of this letter is to describe the evaluation so that we can make arrangements with you for access.

Although it is presently vacant, the 50 Tufts Street property historically was used by several different companies as a laundry chemical distribution facility. Chlorinated volatile organic compounds (VOCs), particularly tetrachloroethylene (also called perchloroethylene or PCE), have been detected in soil, groundwater and indoor air at 50 Tufts Street. These chemicals also have been detected in monitoring wells east of the property, and in indoor air in some of the buildings near the property. GEI is undertaking an investigation in the other buildings near the property to confirm whether they may be affected, and to take measures to prevent that from occurring.

We therefore request your cooperation in this investigation. We would like to visit your property to conduct the following tasks:

- An engineer from GEI would like to collect detailed information about your basement, including the type and condition of the foundation, as well as information on your home's heating and cooling system. These observations should take approximately 2 to 3 hours.
- GEI also would like to install two sub-slab monitoring points at inconspicuous locations in the basement. These will be installed by drilling a small hole (3/4 inch diameter) through the basement slab and inserting tubing. We will measure the pressure beneath the slab and collect a sample of the soil gas from beneath the slab for laboratory testing. A picture of what this sampling looks like is shown on the attached Figure 1.

We will then discuss the results of the basement evaluation and the soil gas sampling with you. If, these observations and the laboratory testing indicate that the air inside your property may be affected, we would request your cooperation with the following additional tasks:

- GEI would arrange for a contractor to seal any visible cracks, seams, and utility penetrations in your basement. The purpose of the sealing is to close potential pathways for air to move from the ground through the slab and into your home.

- Depending on the results of the soil gas sampling, we may recommend installation of a sub-slab depressurization system similar to that depicted on the attached Figure 2. The system is the same as that commonly used to address radon in homes, and will be installed by a licensed radon contractor. A typical design includes coring one or two holes (of approximately 4-inch diameter) through the basement slab and attaching PVC piping to each. The pipes are then run overhead or along the wall, and joined to one common pipe before exiting through the wall to the exterior of the house. A small inline fan is installed in the exterior pipe and the pipe is extended up the outside wall to above the eaves of the house. Figure 3 shows an example of the exterior exhaust piping associated with a sub-slab depressurization system. Such systems have been installed in thousands of homes throughout New England and the rest of the United States.
- If a sub-slab depressurization system is recommended, we will install a temporary portable air purifier in the basement. The air purifiers will be the VOCARB 5000 model manufactured by Allerair of Montreal, Quebec. The purifiers will be operated on the "high" setting. GEI will inspect and clean the air purifiers quarterly. Once the SSDS is installed, the air purifier will no longer be operated and removed.

Thank you for your assistance. I will be contacting you shortly to discuss our plans further, and answer any questions you might have. If you have any questions in the interim please do not hesitate to contact me at 781-721-4012.

Sincerely,

GEI CONSULTANTS, INC.


Ileen S. Gladstone, P.E., LSP
Vice President

ISG:jah

c: Brian Keegan, UniFirst Corporation
Peter Mills, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection

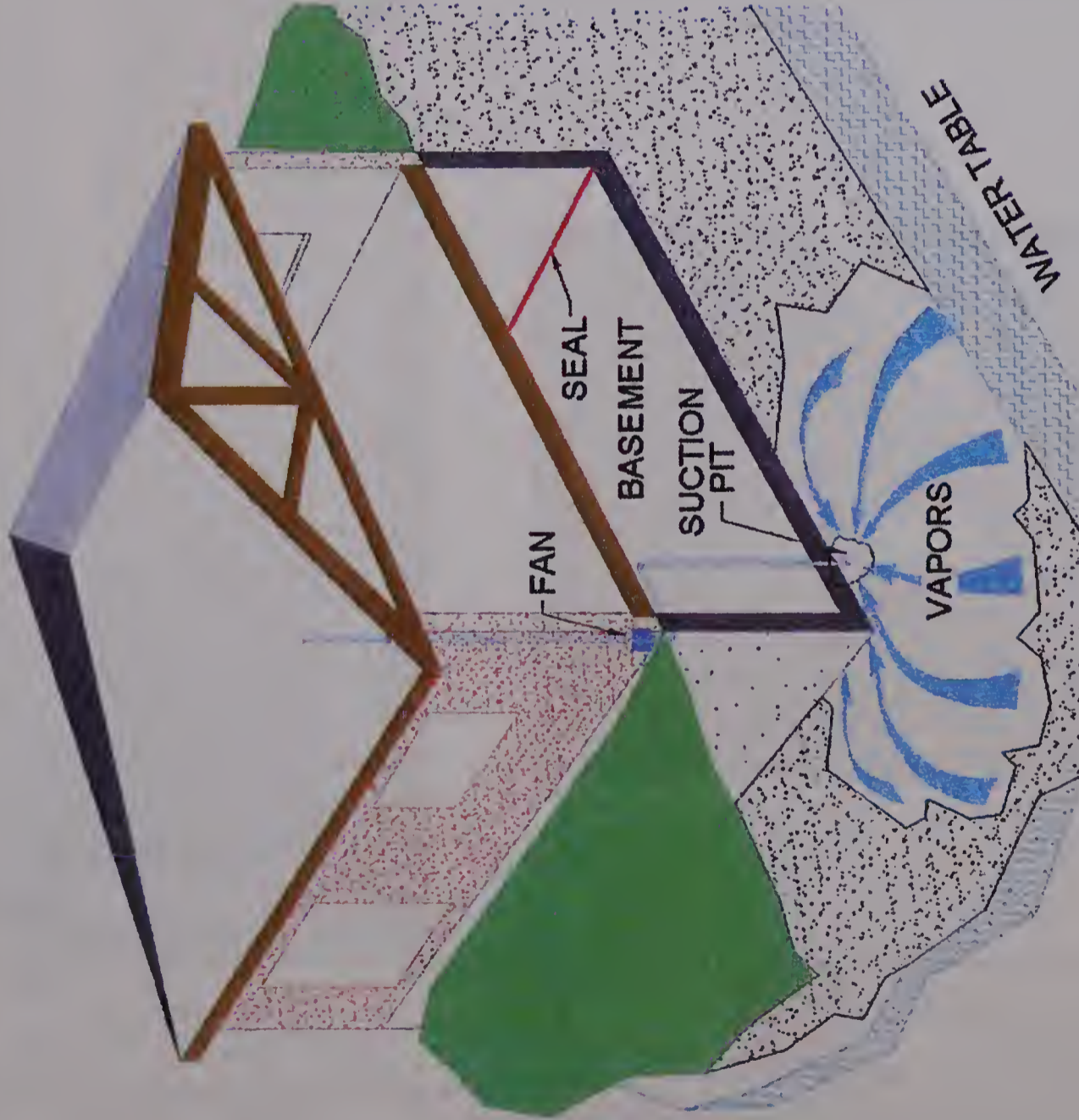
N:\04516\Final\2.0 Correspondence\2.4 Residences\New Resident Mar-07\Property Evaluation-1.DOC



50 Tufts Street Somerville, Massachusetts		 GEI Consultants	TEMPORARY SUB-SLAB MONITORING POINT
UniFirst Corporation Wilmington, Massachusetts			Project 04516-2
			February 2007
			Fig. 1

045160-48 dlm 1/25/07

Sub-Slab Depressurization



- Intercepts vapors prior to building entry
- Same as "radon" system
- Most commonly used method for radon and VOC control
- Highly effective in most settings
- Up to 99.5%+ reductions
- Reduction >90% requires higher QA/QC

50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



SUB-SLAB DEPRESSURIZATION
SYSTEM

Project 04516-2

February 2007

Fig. 2



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

EXTERIOR EXHAUST PIPING
FOR SUB-SLAB
DEPRESSURIZATION SYSTEM

February 2007

Fig. 3



Geotechnical
Environmental and
Water Resources
Engineering

March 14, 2007
Project 04516-2

«Owner»
«CoOwner»
«Address_1»
«Address_2»
«City_State»

Dear «Salutation»:

**Re: Cost of Indoor Air Sampling
«Property»
Somerville, Massachusetts**

You recently received a letter from me requesting your cooperation in providing access to GEI Consultants, Inc. (GEI) to conduct testing and, if appropriate, to institute mitigation measures on your property. I should have made clear in my letter that the work proposed will be conducted by GEI at no cost to you.

Thank you for your assistance. If you have any questions please do not hesitate to contact me at 781-721-4012.

Sincerely,

GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP
Vice President

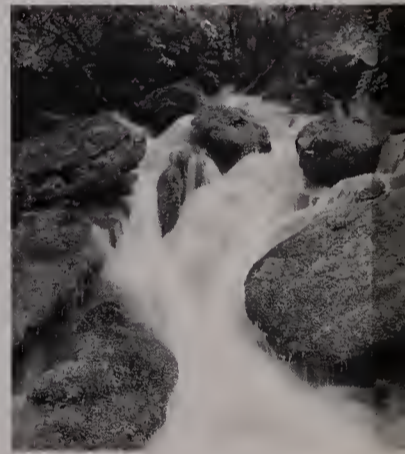
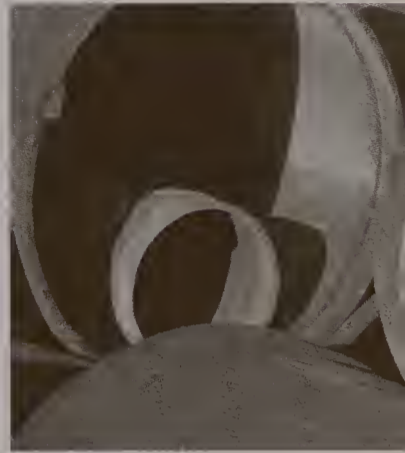
ISG:jah

c: Brian Keegan, UniFirst Corporation
Peter Mills, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection

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Geotechnical
Environmental and
Water Resources
Engineering



ATTACHMENT C

Air Purifier Information



5000 Vocarb

Specially designed for airborne chemical and odor problems

Impregnated activated carbon bed alleviates environments with Volatile Organic Compounds (VOC)



Volatile Organic Compounds are chemicals released by many household products. Our 5000 Vocarb model includes special features to trap these VOCs.

Any of 40 specially-blended carbon beds

- 18 lbs of activated carbon is impregnated with catalysis to increase adsorption capacity for specific VOCs
- AllerAir air quality experts create custom blends to deal with any VOC.

HEPA filtration

- HEPA filter traps 99.97% of particles as small as 0.3 microns.

Pre-filter

- Traps larger particles to prolong the life of your HEPA and Carbon filters.
- 2 anti-microbial filters suppress any microorganisms around the filter.
- Easy and rapid cleaning can be done in 30 seconds.

Robust all-metal housing

- Baked enamel housing avoids the release of vapors from plastics and ensures that no harmful gasses are released.
- 18 gauge steel.
- Cylindrical shape maximizes airflow.

3-speed fan

- 400 cubic feet per minute
- Turbo setting completely circulates the surrounding air.
- 10 year Guarantee.
- Can change air up to 12 times an hour in smaller rooms.
- Cleans up to 1500 square feet.
- Quiet motor is ideal for overnight use.
- Low electrical consumption (80 Watt average).

Options

- Over 40 different blends of impregnated carbon available.
- Positive and negative air attachments.
- Attachment for central air system.
- D and DX models available.

Eliminates VOCs often found in the home:

- | | |
|------------------|----------------------|
| - Formaldehyde | - Mold Toxins |
| - Ammonia | - Methylene chloride |
| - Sulfur dioxide | - Toluene |
| | - Tobacco smoke |

The 5000 VOCARB

18 lbs. of specially impregnated activated carbon, combined with true HEPA

15"



Shipping Weight: 50 lbs

Traps particles:

- Pollen
- Dust
- Dust mites
- Pet dander

Adsorb Chemicals, gasses and Odors:

- Airborne chemicals
- Mold toxins
- Paint fumes
- Cleaners
- Solvents
- Furniture glue
- Carpets
- Plastics
- Insulation materials
- Printer emissions
- Cigarette smoke

20.5"

Invest in the health of your family with the AllerAir 5000 Vocarb



AllerAir Industries Inc. Toll free 1-888-852-8247 / Fax: 1-877-688-2193 www.allerair.com

The 5000 Vocab

**Impregnated activated carbon bed
alleviates environments with Volatile Organic Compounds (VOC)**

The EPA identifies indoor air quality as the number one pollution problem we have today.

We spend up to 90% of each day indoors, and half of that time is in our own home.

Most domestic purifiers only protect you from particles. They spray a few grams of carbon on mesh, but that's simply not enough to protect you from the hazardous effects of gasses odors and chemicals.

Impregnated activated carbon is the material the military uses for their gas masks.

An effective air purifier increases the quality of your life, so invest in an AllerAir unit today.

Facts about VOCs

- The EPA has found that levels of VOCs are 2 to 3 times higher than they originally believed.
- Many VOCs are known carcinogens.
- Everyday household products which contain VOCs include:
 - Paint, wood preserves and solvents
 - Aerosol spray
 - Disinfectant. Moth repellent and air freshener
 - Hobby supplies
 - Fuels and automotive products
 - Dry-cleaned clothing
- Even when these products are stored, they continue to emit VOCs.
- Upon the use of these products, VOC levels are up to 500 times higher than usual.

Dangerous health effects associated with exposure to VOCs

- Eye, nose and throat irritation.
- Headaches, nausea and diminished coordination.
- Liver, kidney and central nervous system damage.

Examples of VOCs often found in indoor air:

Formaldehyde

A known carcinogen found in older insulation, furniture, carpet, glue and tobacco smoke. Leads to burning in your throat, watery eyes, nausea, difficulty breathing, and it can bring on asthma attacks.

Mold micro-toxins

These highly carcinogenic VOCs are the by-product of mold infestations (even when they are dead and dried up). They are toxic to humans.

Tobacco smoke

A known carcinogen found to contain more than 400 chemicals and gasses.

Methylene chloride

A known carcinogen found in aerosol paint and solvent causes symptoms associated with carbon monoxide.

Ammonia

Originate from cleaning products and litter boxes, these VOCs cause eye and skin irritation, nose bleeding and sinus problems.

**Chemicals have replaced bacteria and virus as the main threat
to human health in western industrial nations**

